# ENGINEERING 'ROUND ABOUT COLUMBUS

nspected by
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## I. In Memory of Jerry O'Shaughnessey

It may be true, as the newer physics teaches, that what we call matter is a great system of forces, and that the spaces between electrons and their controlling nuclei are as great, relatively, as the voids surrounding the bodies of the Universe. Still we have to work with these forces. and so deal with substances, one of the most important of which is water.

The human body is almost half water. Mushrooms run up to ninety-four or five percent. Milk, strange as it may seem, is eighty-seven percent. These rather odd facts, coupled with our everyday experiences with the "fluid of life" indisputably establish our dependence on water for our very existence.

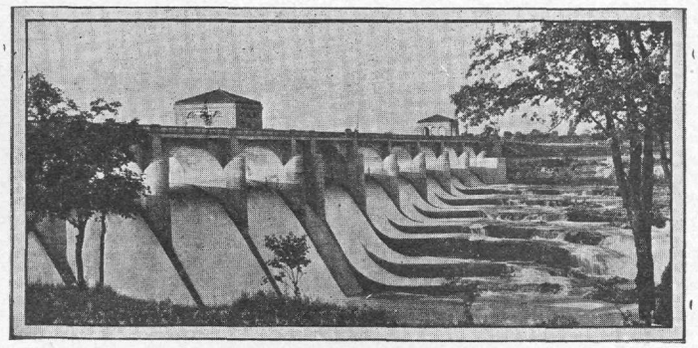
Getting a line on the waterworks of Columbus the other day, we started out by going to the source, the reservoirs that catch the water of the Scioto River when there is plenty of it and dole it out in dry times. There are two reservoirs. The upper one is O'Shaughnessy Dam, fifteen miles or more from the heart of the city, rather far for hiking but just right for an expedition by automobile, particularly on a glorious autumn day.

The easiest way to lay a course to O'Shaughnessey Dam is to consult a highway map and follow Ohio Highway Route No. 257 several miles up the Scioto River, above the village of Dublin. We come to a sign telling us that we are leaving Franklin County—of which Columbus is the capital—and entering Delaware County. At the county line is a curious little space beside the road with a red granite tombstone, on which is carved the name LEATHERLIPS. According to the inscription, Leatherlips was a chief of the Wyandotte Tribe who was executed on that spot June 1st, 1810, but whether by white men or Indians, the stone does not say.

As we round a bend in the road the Dam comes into view, an impressive sight. Much of the impressiveness comes from the bridge, a dozen arches, striding across the top.

At the middle, in the notch of the valley, the Dam is eighty-five feet high. On the sides the concrete is stepped up, over blocks of limestone. The curve of the rollway-crest, as it is called, seems to offer a good opportunity to use mathematics in getting a slope down which the water will slide easily and then be pushed away at the bottom.

O'Shaughnessey Dam is one of the reminders that a man who does a job well may have the satisfaction in doing it while he is alive and honor after he is gone. A



*O'Shaughnessey Dam*

bronze tablet at the pavilion at one end of the structure informs us that it was named for Jerry O'Shaughnessey, superintendent of the waterworks for many years. Another tablet shows Mr. O'Shaughnessey's face in relief, a strong countenance, with a large nose, undoubtedly Irish, at least, when one knows the name.

The tablets give us more information. Besides the names of the Mayor and other dignitaries and the contractor, the technical men come in for recognition too, as is altogether proper, from the consulting engineer and architect on down to the assistant engineers in the field.

Another tablet gives statistics. The reservoir was built in 1922-24 and cost nearly two and a quarter million dollars, only a little more than half of that in the dam proper, and the rest in land, roads, and damages. The concrete dam is 879 feet long and the earth approaches 871 feet, making a total of 1750 feet, a third of a mile. Filled to the top it was computed to hold five billion four hundred million (sounds like a government appropriation bill) gallons, but the silt deposited during the past ten years has doubtless cut that figure down a great deal. Columbus uses on the average thirty million gallons of water a day, so the reservoir—which extends eight miles up the valley and covers 829 acres—holds enough to supply the city for half a year.

The Scioto basin above O'Shaughnessey Dam is about a thousand square miles. Each square mile contains 640 acres, each acre 43,560 square feet, and each square foot 144 square inches. Setting up that problem on a slide rule we see that something less than a third of an inch of water over the whole watershed would fill the reservoir to overflowing.

In flood times the water goes booming over O'Shaughnessey. The top flood for which the structure was designed would be a sight to see—twelve and a half feet

pouring over the crest—but nothing like that has happened since the dam was built. Where the water is only a few inches deep across the dam, the concrete surface seems to be covered with lace of a pale coffee color.

It takes Nature to show how things really are. The day we were at O'Shaughnessey the water was just below the crest of the dam all the way across except at one end where a stream about half an inch deep was trickling down showing that the dam crest was not quite level.

A dam wouldn't do much good if there weren't a way to draw the water down. To acccomplish this there is a valve-house at one end of the dam and in the middle—carefully locked to keep irresponsible people from meddling. When we were there the only sign that water was going through was a buzzing sound at the middle house and a gentle movement in the pool below the dam.

One thing, it seems, the builders of O'Shaughnessey hardly counted on—the fact that the reservoir would become one of the most popular parks of Columbus, with the city Zoo as one of the attractions. A dozen years ago, too, scarcely anyone foresaw that the automobile would become as nearly universal as it is today. Consequently on holidays the bridge is a bottleneck. The roadway is only seventeen and a half feet wide with four foot sidewalks.

And so the fact is borne out that many men need to be consulted in making a great improvement. The brilliant dam engineer may lack vision when it comes to laying out parks and handling traffic. It takes all sorts of engineers to make a world.

## II. The Dam That Didn't Burst

In the spring of 1913 Columbus was visited by a flood that swept through the lower sections of the city and caused great loss of life. Like all calamities it had its amusing side. One of the funniest things about it was the rumor, sweeping through the streets and starting many citizens on the run for higher ground, that "the Dam has bust."

The "Dam" was the waterworks dam on the Scioto River about five miles away from the heart of the city, a concrete structure a thousand feet long with a rollway half as long arching gracefully upstream. When dedicated in November, 1905, this was the waterworks dam of Columbus. It made a reservoir six miles long and capable of holding 1,627,000 gallons, enough to supply the much smaller city of those days as long as seemed necessary between rains. All told, it cost $700,000. That was about the same on a gallon basis as the O'Shaughnessey, built twenty years later and after the War had doubled prices.

Later, when the city had a second dam, this first one was named Griggs after Julian Griggs, the consulting engineer when it was built.

The rumor that the Griggs Dam had broken was as rumors often are, grossly exaggerated. The Dam held throughout the 1913 flood, and it is still apparently as good as ever, an important part of the Columbus water system and a worthy monument to the men who built it. Riverside Park, along the reservoir's shores is the most popular picnic spot around the city. Water is nature's best-liked touch. Thanks to O'Shaughnessey Dam the authorities can keep the Griggs Lake from getting low enough to spoil the pleasure of boating and fishing.

## III. The New "Stone" Bridge

Between O'Shaughnessey Dam and Griggs Dam is one of the most impressive bits of engineering around Columbus, the new highway bridge across the Scioto River at Dublin. Right now it's at the most interesting stage. When it's completed it will still be worth going to look at, but the student engineer who makes the effort to get over during construction will be adequately rewarded for his pains.

Huge parties of students had better make arrangements at the field engineer's office. Otherwise they might be told to go away and not bother the form builders and steel setters.

"The University" is an open sesame in all sorts of places. We were well out on the new bridge when a foreman addressed us sharply.

"What are you doing here?" he demanded.

"Just making an inspection," we replied.

"Hum," he grunted. "Where are you from?"

And when we said "The University" that was all there was to it. We were permitted to go ahead and "inspect" to our heart's content.

The stranger on a construction job is a marked figure. We swelled our chest and hoped we looked like important people from the main office of the State Highway Department, or perhaps a visiting delegation from abroad.

At Dublin the important highway up and down the river—connecting the two dams and reservoir parks—crosses the road east and west at the end of the bridge. Now a cross road at the end of a bridge is a thing to be avoided. The engineers pondered the problem and considered putting in a "Clover Leaf," one of those formidable layouts that enables any kind of turn to be made without crossing traffic, but that was discarded. And the only variation from a simple cross-road is a pavement for southbound traffic along the River through the first arch of the bridge.

No doubt many people admiring the Dublin bridge will speak of it as having the strength and beauty that only stone can give. Beautiful, indeed, is its stone masonry. But those who travel the underpass through the first arch will see the bridge for what it is—a structure of reinforced concrete with a stone veneer.

At the east end the bridge was nearly finished, with workmen laying up the stone and building the railing. On the Dublin side only the arch ribs were in place and the carpenters were building forms and placing steel for the walls and floors. Conditions were excellent to get a good picture of the construction.

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We were fortunate in meeting Mr. Redrick of the Highway Department division office, who urged us to come back when concrete was being vibrated into place around the reinforcing steel.

"People often ask about those shots in the stone facing," said Mr. Redrick. "Some think they're for drainage. Odd, isn't it, that we have to put in such things just for architectural effect, to make the bridge look right?"

Perhaps our feeling the slots in stone masonry are architecturally correct is a hang over from the days of castles with their narrow windows.

Building an important project like the Dublin Bridge resembles cooking a complete dinner—there's a real art in getting the various parts ready at the same time. It takes a balanced organization. There was work in several stages on the bridge proper, and still more stages on the approach highway. Some part of this work was still being planned, for a surveying party was receiving a line in an attempt to get the best location of the road through the underpass. Part was far enough along for a roller to be ironing out the driving surface. Final garnish will be the planting of the "landskipper" to make the improvement fit the country and be a thing of beauty.